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## Books

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IMMUNITY. Second Edition. By Sidney Raffel. Pp. 646, Appleton-Century-Crofts, Inc., New York, 1961. Price, \$10.00.

In the less than ten years which have elapsed since the publication of the first edition of this book, there has been a veritable avalanche of investigations on immunity, using tools fashioned by physiologists, biochemists, biophysicists, geneticists, endocrinologists, and cytologists, not to mention those introduced by professional microbiologists, immunologists, and pathologists. Yet, in the face of this constantly accelerating flood of new information, Dr. Raffel, in the opinion of the reviewer, has weighed, marshalled, and integrated the evidence into a cyclopedic, restrained, and comprehensive—though admittedly interim—assessment of our present knowledge of the nature of immunity in infectious diseases and other pathologic processes in man and animals which have their origin in immunologic phenomena.

The book is divided into four sections. The first deals with the fundamental aspects of immunity, such as the mechanism of virulence and pathogenicity, the mechanisms of native and acquired resistance, and the role of specific antibodies in immunity, which Dr. Raffel sharply delimits with unassailable criteria. There is a separate chapter devoted to the protective effects of antibody, and another to nonantibody defense mechanisms. In the latter category the surge of investigations on the so-called nonspecific factors in resistance is critically considered and evaluated. There are several chapters devoted to the production of antibodies, to the cells which partake in their formation, the chemical properties of antibodies, the mechanisms of antigen-antibody reactions, the serologic manifestations of these reactions, and, finally, the multifarious factors which influence antibody formation and the immune processes in general.

In the second section of this volume are considered the hypersensitivity phenomena which result from antigen-antibody interactions in the tissues, both the immediate type, in which humoral antibodies play the major role, and the delayed type. In the latter, the antibodies are not, thus far, detectable in the body fluids but are possibly avidly anchored by the cells, which are injured by the penetration of the specific antigen to their surfaces or to their internal substance. The severe inflammation that follows their injury plays no significant role in the acquired resistance. For, as has been demonstrated by Dr. Raffel, one can induce specific

tuberculin sensitivity by the administration of combined protein and certain lipids of the tubercle bacillus, but no increased resistance to the infection results from this delayed hypersensitivity. Therefore he concludes that, although under natural conditions of infection delayed hypersensitivity and increased resistance are concomitant phenomena, they are nevertheless independent of each other.

In the third section of this volume the author analyzes the forces responsible for resistance in various diseases such as pneumococcal infections, diphtheria, and tuberculosis, as well as a variety of other bacterial and viral infections. In each of these he elucidates the current information on the role of specific antibodies, metabolic phenomena, cellular activity, physical factors, et cetera, in native and acquired resistance. As an illustration of an infectious disease in which specific antibody is the dominant factor in resistance, Dr. Raffel penetratingly analyzes the capsular polysaccharides, which are the principal factors in the virulence of the numerous types of pneumococci. It is the capsule of the various types of pneumococci which prevents their *ready* ingestion by leukocytes, in the cytoplasm of which the cocci are destroyed. It is the action of the antibody against the specific type of pneumococcal polysaccharide which enables ready phagocytosis and destruction of the pneumococci. Resistance can be passively transferred to normal animals by serum containing the specific anticapsular antibody. If the immune serum is deprived of all antibodies except those directed against the capsular polysaccharide, it retains its ability to confer specific resistance. Finally, vaccination with *purified* polysaccharide, alone, induces resistance against infection with the homologous type of pneumococcus. Thus all the rigid criteria for the essential role of specific antibody in acquired resistance to this infection are satisfied in pneumococcal disease. Similarly, it is the neutralization of the exotoxin elaborated by the diphtheria bacilli on the surface of certain tissues which is the *sine qua non* of the mechanism of resistance against diphtheria. As pointed out by Dr. Raffel, such a role of the presently known antibodies, by themselves alone, can account for acquired resistance in but a very limited number of infections.

At the other extreme is tuberculosis, in which efforts by innumerable investigators have failed to provide satisfactory evidence that humoral antibodies elaborated in this disease can, by themselves, account for the acquired resistance which undoubtedly follows a primary infection with this micro-

organism. Raffel concludes, on the basis of an extensive review of available information, that acquired resistance to tuberculosis may depend on the composite effects of numerous forces, among which may be mentioned unfavorable conditions for the multiplication of the bacillus in the lesion, such as excess of lactic acid; the paucity of oxygen available to the bacillus, which is essentially an aerobic organism; nonspecific or perhaps adaptive stimulation of the activity of the histiocytes, which increases the destructive capacity of the intracellular bacilli; and the nonantibody bacteriostatic effects of body fluids on the tubercle bacillus.

The last section deals with serology and antigenic systems, and a discussion of microbial antigens, toxins, and cellular and tissue antigens. Certain diseases, such as rheumatic fever, disseminated lupus erythematosus, thyroiditis, allergic encephalomyelitis, et cetera, are also examined, and the immunologic mechanisms which may underlie these disease states are scrutinized with the same detachment, clarity, brevity, and skill which characterize the entire book. It must be emphasized, however, that the growth of the various disciplines upon which knowledge of the immunologic processes depends is so rapid and continuous that, despite the thoroughness and excellence of the book, it is, as the author himself implies, but an interim report of an unending scientific research into one fraction of an integrated, interactive biologic organization—life.

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**RESPIRATION IN HEALTH AND DISEASE.** By R. M. Cherniack and L. Cherniack. Pp. 403, W. B. Saunders Company, Philadelphia and London, 1961. Price, \$10.50.

Reuben and Louis Cherniack have drawn on their extensive clinical and physiologic experience to write a book on some aspects of pulmonary disease which is instructive and interesting. It is the authors' aim in this volume to describe various aspects of respiratory disease by means of presentations that emphasize physiologic mechanisms and that do not stress the pathologic or morphologic changes that characterize specific diseases.

In the first of four sections most of the physiologic mechanisms that are important to an understanding of pulmonary disease are presented. In the other three sections the authors consider the signs and symptoms of respiratory disease, the various patterns of pulmonary disease, and methods of assessing such disease.

The first section can be highly recommended to

medical students and all other newcomers to the field of pulmonary physiology. In it most of the basic concepts of pulmonary physiology are presented in a lucid and relatively nontechnical fashion. It is excellently illustrated by simple and easily understood line drawings and diagrams.

In the other three sections of the book, the authors attempt to cover a large and rather disparate group of subjects in a relatively limited space. This has, of course, required a selection of the material to be presented, and makes it likely that some readers of the book will think that important subjects have been passed over superficially, that simple subjects have been described in unnecessary detail, or that uncertain or unproved facts have sometimes been recorded dogmatically. Throughout these sections, the authors systematically continue to explore the pathologic and physiologic mechanisms of pulmonary disease. Their expositions are particularly instructive when they are based on quantitative measurements and solid observations, but they are stimulating even when they derive from thoughtful speculation.

An excellent list of suggested additional reading is included; however, this reviewer believes that the book would be improved if bibliographic references to support many of the statements in the text were included. All students of medical subjects should frequently wish to consult the original observations that have lead to important conclusions.

This book contains a great deal of information on the physiologic approach to pulmonary disease in a form that makes it particularly useful and assessable. Some parts of it should be read and reread by all students and teachers of pulmonary disease.

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**ATLAS OF MEDICAL MYCOLOGY.** By Emma Sadler Moss and Albert Louis McQuown. Pp. 335, The Williams & Wilkins Company, Baltimore, 1960. Price, \$11.00.

In the preface to the first edition of this book the authors stated, "this atlas is the natural outcome of a series of exhibits for medical conventions, demonstrations, and lectures which were prepared as part of the training program for our residents in pathology, clinical residents, medical students, and medical technologists." This statement summarizes concisely the merits and defects of this book and specifies the groups to which this second edition will continue to have considerable appeal.

The pathologic, mycologic, and clinical illustrations are excellent. As noted above, the text was